# BIRTH BEHAVIOR OF THE SCORPION UROCTONUS MORDAX THORELL (VAEJOVIDAE)[1]

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Introduction.—Williams (1969) discussed at length various birth activities of several North American scorpions, notably those of the genus *Vaejovis*. Since that work, I have made observations on captive specimens of *Uroctonus mordax* Thorell, which reveal that significant variation of birth patterns exists within the family Vaejovidae. Described and discussed herein are the more striking aspects of this variation.

Methods.—Specimens of *U. mordax* were collected from Sequoia and Yosemite National Forests in early June and July, 1971, and kept separately. Data were recorded for three births. Two mothers gave birth while kept in plain plastic containers; the third gave birth in a terrarium provided with soil, rocks, and a piece of bark. Each scorpion, though having fed little since capture, appeared healthy from the time of delivery to well after the young had matured and left.

Results.—Births occurred on 1, 6 and 14 September 1971. The first delivery was not observed. The second and third mothers had each delivered about six young when my observations began, at about 0700 PDT. Parturition was not closely observed due to the positions of the mothers in their cages.

Both mothers assumed a stilting posture similar to that described by Williams (*op. cit.*, p. 3) in *Vaejovis spinigerus* (Wood). The first two pairs of walking legs were pulled somewhat under the body, supporting the young after they emerged. Such support was not entirely effective, however, as several babies rested partly on the cage floor.

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Most young, after leaving the birth membrane, climbed onto the mother's back along her first two pairs of walking legs or chelicerae. However, several climbed down to the floor and ascended another leg. All but one baby, which was not healthy, ascended and eventually matured to the second instar. Delivery and ascent for each litter took about 8 to 12 hours. Litters ranged from 23 to 41 young.

No particular orientation occurred among the first instars upon the mother. They faced in all directions, but those in contact with the mother usually laid transversely on her back. All rested with the metasoma held U-shaped over their back. As more young ascended, they began to climb onto the first babies, even though there was always open space on the mother's back. Ultimately, a randomly constructed pile was formed, three to four babies high, which covered one-half to two-thirds of the mother's dorsal trunk area.

The piles occurred at various places along the trunk, occasionally spilling onto the base of the cauda, or covering the median eyes. Often the young were observed moving within the pile; peripheral young were especially active, apparently seeking more favorable locations. No pile was secure on the mother's back. The babies clung mainly to one another.

Repeated efforts to photograph the families resulted in upsetting the mothers and spilling the piles, which toppled more or less intact. However, when a litter and mother were then placed close together and left undisturbed, the young would invariably locate her and reascend within one to two hours and form another pile. The mothers showed no cannibalistic behavior toward any of the babies.

Unless disturbed, the mothers were conspicuously inactive during the first instar period, invariably remaining in one spot. The mothers provided with cover were not observed to leave it during this time.

The first instar period lasted 14 to 15 days. The young of each litter then molted on the mother, within 24 hours. In each case, though, several young fell off the mother, completed molting on the ground, and reascended. The exuviae were discarded, and played no role in assisting the young to ride on the mother's back, as reported for other species by Stahnke (1966, p. 78), and as I have observed in *Vaejovis gertschi* Williams.

Permanent departure of the second instars from the mothers was not determined accurately, but appears to have varied from two or three days to as many weeks. This may be due to the conditions of

captivity, but it may as well suggest a natural rate of dispersal. Although the mothers became gradually more active as the second instars matured, those provided with cover remained under it for at least two weeks after the first ecdysis.

Discussion and conclusions.—The random positioning of first instar *Uroctonus* contrasts with the highly organized pattern characteristic of *Vaejovis*, which was described and illustrated by Williams (*op. cit.*, p. 6, figs. 4-6), and which I have also observed in *V. gertschi*. As Williams pointed out (*op. cit.*, pp. 19-20), the *Vaejovis* pattern ensures individual attachment to the mother's back, offering presumably a more secure riding position. Yet, as he also reports, and as I have observed, *Vaejovis* mothers in captivity become relatively inactive, especially during the first instar period, and in the field are rarely seen on the open surface while carrying instars. The sedentary attitude of captive *Uroctonus* is similar, if not exaggerated, and presumably indicative of the behavior occurring in the wild. That it reduces the chance of spilling the precariously piled babies, and in the event of a spill also enables the young to reascend, are obvious advantages.

The two week first instar *Uroctonus* period is similar in length to that of *Vaejovis*, and also *Hadrurus* (Stahnke, *loc. cit.*), although the second instar-mother association may be briefer. It is at least evident that *Uroctonus* second instars are more precocious wanderers. The *Uroctonus* mother served as a locus of activity, from which the second instars gradually dispersed. Essentially, the first break in the mother-instar bond appeared at the first ecdysis. Judging from their activity, it seems very probable that young *Uroctonus* one or two days into the second stadium could survive independently.

Because *U. mordax* is generally distributed along the winter snow line in areas of Oregon and California, the seasons would severely restrict this species' annual activity. It is evident that one litter is produced each year, that being in the late summer. No mothers were found carrying instars in June or July. Early instar *Uroctonus* were rarely encountered at this time.

In application, the marked variation of birth behavior, particularly among first instars, within the family Vaejovidae discussed above appears to support the status of *Uroctonus* as a separate genus, a point which has been debated by Gertsch (Gertsch and Allred, 1965, p. 4).

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**2.0170 Birth behavior of the scorpion Uroctonus mordax Thorell (Vaejovidae).**

Abstract.—First instar *Uroctonus mordax* Thorell arranged themselves on the mother in a randomly constructed pile 3 to 4 babies high, instead of assuming the highly organized orientation characteristic of the genus *Vaejovis*. The pile rested precariously on the mother's trunk, but a compensating behavior was apparent by the mother's assuming a sedentary attitude throughout the first instar period. Second instar *Uroctonus* showed more precocious wandering activity than occurs in *Vaejovis*.—*Richard M. Haradon, 502 Palisades Avenue, Santa Monica, CA 90402.*

*Descriptors*: Scorpion; Scorpionida; Vaejovidae; *Uroctonus*; *Uroctonus mordax*; birth behavior.